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## Effect of post-harvest starvation and rinsing on microbial numbers in mealworm larvae

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Mealworms (*Tenebrio molitor*) reared for feed and food are commonly starved 1-2 days after harvest before being killed to empty their gut and presumably lower the microbial load for sanitary reasons. This study aimed to assess the bacterial numbers in mealworms before and after starvation 24 h or 48 h and also the effect of rinsing the mealworms with water. At start of the experiment, mealworm larvae (*Tenebrio molitor*) close to pupation were separated from their flour based substrate. Sub-samples of 8 g mealworm were collected 0 h, 24 h and 48 h after separation and either homogenized directly in a sterile mortar or rinsed twice beforehand in 100 ml water for 1 min at 200 rpm (each treatment sampled in duplicate). For each sample, ten-fold dilutions series were prepared from 5 g of homogenized mealworm in 45 ml saline (0.9% NaCl, 0.1% peptone). Each dilution was plated on Plate Count Agar (PCA) (0.1 ml) and Enterobacteriaceae Count Plate (ECP) (Petrifilm, 3M Danmark) (1 ml). PCA and ECP were incubated overnight at 37°C before counting of colonies. The aerobic count was  $8.3 \pm 0.1$ ,  $7.9 \pm 0.3$  and  $7.9 \pm 0.1$  Log CFU/g in average ( $\pm$ SD) for 0, 24 and 48 h of starvation, respectively, with no effect of rinsing in water. Also the effect of starvation did not seem to affect the resulting microbial load markedly. The *Enterobacteriaceae* numbers were  $6.9 \pm 0.4$ ,  $5.9 \pm 0.3$  and  $7.0 \pm 0.4$  Log CFU/g in average ( $\pm$ SD) for 0, 24 and 48 h of starvation. The explanation for the observed reduction of *Enterobacteriaceae* of approx. 1 Log CFU/g after 24 h but not after 48 h starvation is uncertain. The *Enterobacteriaceae* family of Gram-negative bacteria includes both harmless bacteria as well as human pathogens like *Salmonella* and *Escherichia coli*. Although the taxonomic level was not resolved further in this study, this finding emphasizes that means to reduce the bacterial needs to be established as post-harvest starvation alone has little effect on the microbial load in mealworms. More knowledge about how the microbial composition and load of the feed substrate influences the microbial content in the mealworm larvae may help to ensure the microbial quality of mealworm products.